

quadrivalent character of the oxygen atom, which received such remarkable confirmation a few years ago through the researches of Prof. Norman Collie and his colleagues, now finds definite expression in the formulæ of the oxazines and certain other colouring matters.

In two respects the present edition differs from its predecessor. The tables for the qualitative examination of colouring matters have been omitted, and in their place a section on the natural dyestuffs has been added at the end of the tables of artificial colouring matters. This new section is of interest from many points of view. It serves, in the first place, to remind us that natural dyestuffs have not yet been entirely superseded by synthetical coal-tar products. It also brings out the fact that with respect to the chemistry of these vegetable colouring matters pure science is in advance of technology, inasmuch as the constitutional formula of the majority of these compounds has been determined with more or less probability. With the exception, however, of luteolin, the colouring matter of weld, which has been synthesised by Kostanecki and his colleagues, none of the products entered in this last table have been produced by laboratory processes. Such important colouring matters and dyestuffs as hæmatoxylin from logwood, brazilin from Brazil wood, quercetin from quercitron, and rhamnetin from Persian berries have for many years been undergoing investigation here and abroad, and some or all of these may have to be transferred to the tables of artificial products by the time this work reaches a new edition. Supposing such syntheses to be accomplished, the struggle between the synthetical and the natural products will no doubt furnish the industrial world with further material for serious reflection. Whether the result of the artificial production of these outstanding members of a group which supplied the world with dyestuffs before the discovery of the coal-tar products will be the same as that which followed the synthesis of alizarin, and threatens to follow the synthesis of indigo, it would be extremely rash to predict.

The usual considerations respecting the loss of the coal-tar colour industry to this country cannot but arise in looking through the present series of tables. The enormous development to which attention has been directed in this notice is almost entirely due to German discoveries. The hundreds of patents referred to in the bibliographical columns are German by an overwhelming majority. The causes of this decadence of what was originally a British industry have been so frequently discussed that it would appear that nothing further is to be gained by their reiteration. Of late years, however, two subordinate causes of this decline have been thrust upon public notice with such vehemence that the uninitiated may be led to believe that the "imperfection of our patent laws" and the want of "duty free spirit" have together wrecked manufacturing enterprise in this direction. The present writer is glad of this opportunity of expressing dissent from these statements. An amendment of our patent laws is certainly desirable, and duty free spirit would unquestionably be a boon for certain branches of manufacture. But to exalt these, which may be called minor deterrents, into the rank of a complete explanation of

British failure and German success is simply dragging the proverbial red herring across the trail.

No further commendation of the well-known work which has led to these reflections is necessary than the statement that it is as indispensable as its predecessor to all who are in any way concerned in this branch of chemistry and of chemical technology.

R. MELDOLA.

THE MALAY FAUNA.

Fasciculi Malayenses. Results of an Expedition undertaken by N. Annandale and H. C. Robinson. Zoology. Parts i., ii. and Supplement. By various authors. (London: Longmans, Green and Co., 1903.)

OF late years, mainly owing to the labours of Captain Stanley Flower and to the collections made by the *Skeat* Expedition (of which, by the way, Mr. Annandale was a member), very considerable advances have been made in our knowledge of the vertebrate fauna of the Malay countries. So large, indeed, was the amount of new information thus acquired that it might have been supposed little more remained to be accomplished. If such an idea were ever seriously entertained, it is, however, at once disposed of by the work before us, which, as stated on the title-page, is intended, when complete, to give a full account of the anthropological and zoological results of an expedition to Perak and the Siamese Malay States undertaken during the years 1901 and 1902 by Messrs. Annandale and Robinson, under the auspices of the Universities of Edinburgh and Liverpool. That the wise liberality of these two bodies has been amply justified is fully demonstrated by the present parts, which form only a foretaste of what is to come.

In the introductory note to the mammals, Mr. Robinson states that he was not so successful in the capture of these creatures as he had hoped to be, and that, in his opinion, there are many new small forms yet to be discovered. Nevertheless, Mr. J. L. Bonhote, to whom this section of the work has been entrusted, announces the discovery of eight new species. Among these, the most interesting are, perhaps, a cat and a squirrel respectively allied to *Felis badia* and *Sciurus lowei* of Borneo, and thus indicating a close relation between the faunas of that island and the Malay Peninsula. Not less important is the identification of the Malay porcupine with the *Histrix grotei* of Gray, hitherto known solely by one young example.

Of even greater interest is the series of reptiles and amphibians, which is described by Mr. G. A. Boulenger. In collecting reptiles for the *Skeat* Expedition, Mr. Annandale paid special attention to snakes; on the second occasion his attentions were mainly devoted to lizards; consequently the two collections are complementary. Mr. Boulenger describes as new two frogs, as many tortoises, a lizard and a snake, while he adds one snake and three lizards to the fauna of the Malay Peninsula. The new tortoise (*Testudo pseudemys*) is a near relative of the Burmese brown tortoise (*T. emys*), an isolated species, with the limbs enveloped in a complete bony panoply, which also ranges into the peninsula. In regard to frogs, the most interesting observations are by Mr. Annan-

dale, who states that there is no support whatever to the story told by a Chinaman to Dr. Wallace as to the flying powers of *Rhacophorus nigropalmatus*, or a closely allied form. Consequently, it may be hoped that the fable of the flying frog will disappear from zoological literature—but errors of this sort die hard. Mr. Annandale notices that certain kinds of Malay reptiles are much more brilliantly coloured in the immature than in the adult condition, and likewise records that the giant cobra (*Naia bungarus*) is the object of mimicry by a harmless snake of the genus *Zamenis*, typified by the Indian rat-snake.

Of the invertebrates included in the first section Colonel Swinhoe treats of the moths, and shows in the course of his descriptions that these insects do not display that division into a lowland and a mountain type so noticeable in the case of the birds. Land-planarians, of which one out of the three specimens procured indicates a new species, are described by Mr. F. F. Laidlaw. The six species of parasitic Diptera collected—the first recorded from Malacca—are discussed by Dr. Speiser. Tiger-beetles are treated of by Mr. H. C. Robinson. Finally, dragon-flies fall to the lot of Mr. Laidlaw, who tells us that in respect of these insects the fauna of the Malay Peninsula, as contrasted with its Burmese representative, is much more closely related to that of Sumatra.

Part ii. includes seven articles (together with an appendix), of which the first four are devoted to invertebrates. Mr. W. E. Collinge describes the land molluscs, among which the discovery of one remarkable Bornean genus in the Malay Peninsula is of considerable interest. Rhynchota, of which only a portion of the collection is described, fall to the lot of Mr. W. L. Distant, who records several new forms, illustrated in a coloured plate. Dr. D. Sharp contributes an interesting account of the remarkable and gigantic insects of the genus *Helicopris*. In the vertebrate section, Mr. G. A. Boulenger contributes a list of the freshwater fishes; while Mr. J. Johnston reports on the marine representatives of that group. Especially interesting is a species of mud-skipper of the genus *Periophthalmus* described by the latter gentleman as new, owing to a marked difference in its habits from other species. Finally, Dr. C. W. Andrews contributes a note on a tooth of *Elephas namadicus*, in the course of which he makes the apparently incorrect statement that the species in question occurs in the Upper Siwaliks, whereas it is confined, in India, to the gravels of the Narbada Valley.

While fully appreciating the manner in which this section of the work has been carried out, we may suggest that it would much facilitate reference if in future, instead of the serial title appearing in the headlines of both pages of the text, the titles of the different articles were given on the right-hand pages.

In the supplement Messrs. Annandale and Robinson furnish, in the form of an itinerary, a brief general account of the districts visited, which cannot fail to be of great value to future travellers. In addition to several photographs of scenery, it contains an excellent coloured map of the middle portion of the Malay Peninsula.

R. L.

FIRM FOUNDATIONS.

Vorlesungen über projektive Geometrie. By Prof. F. Enriques. Deutsche Ausgabe von Dr. H. Fleischer. Pp. xiv + 374. (Leipzig: Teubner, 1903.)
Encyklopädie der Elementar-Mathematik. Von H. Weber und J. Wellstein. Erster Band. Elementare Algebra und Analysis. Von H. Weber. Pp. 447. (Leipzig: Teubner, 1903.) Price 8 marks.

THE fact that Prof. Enriques's book has been translated from the original Italian into German at the instigation of Prof. Klein argues much for both its intrinsic merit and its widespread reception; for it is designed to fall within the scope of readers to whom the foreign language presents a greater difficulty than the subject-matter. The warm praise bestowed by Prof. Klein in his introductory notice renders criticism superfluous. He says, "ich kenne keines (Werk), welches den systematischen Aufbau dieser Disziplin in einer dem heutigen Stande der Wissenschaft entsprechenden Form in so durchsichtiger und gleichzeitig so vollständiger Weise darbietet, wie das vorliegende. Dabei ist die Darstellung überall anschaulich und doch völlig streng. . ."

Probably the best known book on the subject is Reye's "Geometrie der Lage," and in the region where the two overlap the present volume is, speaking personally, much more readable. Reye, however, includes a large amount of solid geometry, reaching even Kummer's surface by synthetic methods, whereas Enriques devotes all but one chapter to plane geometry. He makes continual appeal to intuition, but at the same time skilfully bases his system on rigorous logical deductions from six axioms, without becoming tedious. Of the axioms, three deal with incidence, two with order, and the last is Dedekind's axiom of continuity.

Since cross ratio occupies so large a portion of the book, it is unfortunate that the notation is rather confusing; the elements should be named in the order in which they would actually occur if the range were harmonic. There is great practical convenience in doing this, and it is customary at least in this country.

An interesting feature of the book is the chapter on constructions with certain instruments. It is shown that all metrical problems of the first degree are soluble with the aid of a ruler when a square is given, and all problems soluble with ruler and compasses are soluble with a two-edged ruler alone. Certain problems of the third degree appear here for the first time in a text-book.

The volume concludes with a short historical account, which has been increased in the German edition.

The title of the series of three volumes by Herren Weber and Wellstein is possibly appropriate, but certainly misleading, as it suggests a comparison with the great "Encyklopädie der mathematischen Wissenschaften" which is in course of publication by the same firm; whereas there is no similarity, and the present work is written more from a pedagogic point of view than with the intention of supplying an exhaustive work of reference. One can imagine the